Generative AI in Sports Management Education: A Systematic Review and Pilot Study

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Abstract. Generative Artificial Intelligence (GenAI) is reshaping the landscape of higher education, with growing applications in specialized fields such as sports management. This paper presents a systematic literature review (SLR) of 92 peer-reviewed studies published between 2019 and 2025, examining how GenAI tools—including ChatGPT, Bing Copilot, and Google Gemini—are being integrated into sports management education. The review synthesizes evidence across themes of curricular integration, industry readiness, and student perceptions, highlighting how GenAI supports authentic, data-rich learning experiences that bridge academic theory with professional practice. A small-scale pilot study in an undergraduate sports management course further illustrates potential benefits, with students using GenAI to conduct case studies and interpret sports analytics data, leading to improved project performance. While the findings point to significant educational value, the review also identifies gaps in empirical evaluation, large-scale implementation, and ethical integration frameworks. The paper concludes with recommendations for curriculum design, industry-academic collaboration, and future research to ensure that GenAI adoption in sports management education is both pedagogically effective and ethically responsible.

Keywords: Generative Artificial Intelligence · Sports Management Education · Systematic Literature Review · Sports Analytics · Curriculum Design · Higher Education

1 Introduction

Sports management education is undergoing a rapid transformation as Artificial Intelligence (AI) technologies reshape how students acquire, apply, and refine professional skills. In particular, Generative AI (GenAI) tools—such as ChatGPT, Bing Copilot, and Google Gemini—are enabling sports management students to integrate real-time data analysis, scenario simulation, and automated content generation into their coursework and professional training. These capabilities are especially valuable in preparing students for an industry that is increasingly data-driven, competitive, and global in scope.

Despite the growth of sports analytics and AI-assisted decision-making in professional sports, sports management education faces persistent challenges. Students often lack opportunities to apply classroom knowledge to authentic industry contexts, encounter barriers in accessing and interpreting complex

datasets, and receive limited personalized guidance in developing business and operational strategies. These gaps can hinder graduates' readiness for roles that demand both strategic thinking and technical literacy.

Generative AI tools offer unique solutions to these challenges. By enabling natural-language interaction with large datasets, automating repetitive tasks, and generating tailored strategic insights, GenAI can act as both a cognitive assistant and a creative partner. When integrated into sports management curricula, these tools can bridge the gap between theory and practice, allowing students to engage in experiential learning that mirrors real-world professional demands.

This study examines how business students specializing in sports management leverage GenAI tools to enhance learning outcomes and prepare for careers in the sports industry. Through both literature synthesis and ongoing classroom experiments, we explore the pedagogical, cognitive, and practical impacts of GenAI integration in sports-focused business education. Case examples include a student using AI to develop data-driven marketing strategies for a golf influencer business, and another employing AI-assisted analytics in ski coaching and sports event planning.

1.1   Research Questions

This research addresses the following key questions:

1. How can Generative AI tools improve learning outcomes for business students specializing in sports management?
2. What role does GenAI play in preparing these students for real-world challenges in the sports industry?

2   Related Works

2.1   AI in Sports Management Education

The integration of Artificial Intelligence (AI) into sports management education is gaining momentum as both the sports industry and higher education increasingly adopt data-driven decision-making practices. Keiper et al. [10] demonstrated how ChatGPT can be incorporated into sport management curricula to simulate real-world decision-making scenarios, enabling students to develop practical problem-solving skills. Zhou et al. [31] provided a comprehensive review of AI applications in sports, identifying opportunities in performance analysis, strategic planning, and fan engagement.

Recent applied studies extend these insights to more advanced generative and multimodal AI technologies. Baughman et al. [1] examined the use of large-scale generative AI text systems for live sports events such as the US Open and Wimbledon, illustrating how AI can create real-time, context-specific narratives. Lin et al. [13] introduced *SportsBuddy*, an AI-powered sports video storytelling tool evaluated through real-world deployment, showing its potential as a teaching
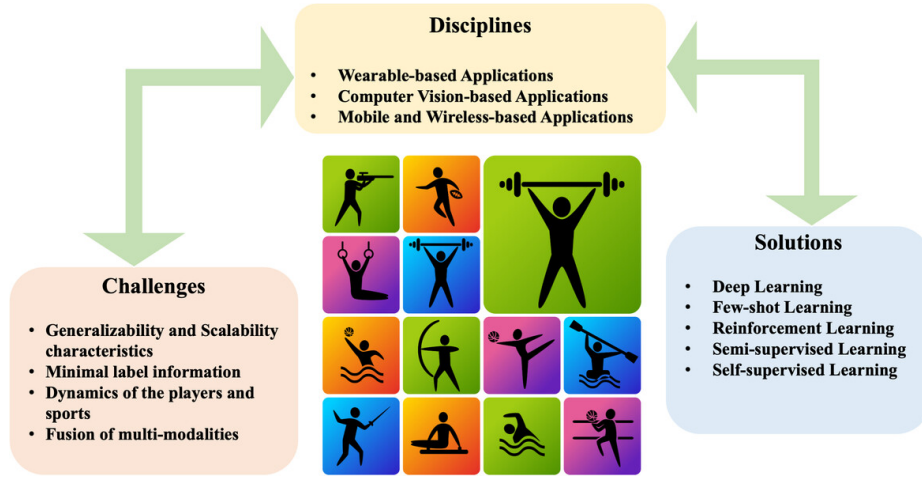
Fig. 1. Overview of AI applications in sports analytics and education [5]

resource for sports media and analytics. Merilehto [15] demonstrated how large language models (LLMs) can convert semi-structured sports database content into structured datasets, significantly reducing manual processing.

Domain-specific applications broaden the educational landscape. Ma et al. [14] developed a multimodal LLM-based table tennis coaching system that combines tactical and technical feedback, offering possibilities for sports analytics education. Dindorf et al. [3] examined psychological and perceptual factors affecting the acceptance of AI-driven sports coaches, while Nalbant and Aydin [18] explored the intersection of AI technologies, digital sports marketing, and sports management, highlighting implications for management curricula. Swim et al. [24] designed a sport management course to improve students' digital literacy, demonstrating curriculum integration strategies relevant to AI adoption.

Qu et al. [20] offer a relevant parallel from computer science education, showing how project-based learning can integrate real-world datasets and AI tools, a model that could inform AI-enhanced sports management curricula. Yunoki et al. [30] similarly reviewed AI integration in music generation for undergraduate researchers, demonstrating how domain-specific AI reviews can inform curricular strategies across disciplines.

Haghparast et al. [8] applied AI language models to foresight planning in sports businesses, combining them with financial management strategies. Jokela [9] analyzed AI's impact on business and management processes in the sports industry, while Glebova et al. [6] emphasized AI's role as part of a suite of digital technologies transforming the sports sector. Tan et al. [25] examined digital management and smart technologies in sports education, linking them to employment, sustainability, and tourism—dimensions that could inform broader educational objectives.

Survey-based and domain-specific evidence reinforces AI's potential. Krämer et al. [11] found that sports students generally expect AI to improve performance and manage complexity, but remain cautious about ethics and over-reliance. Ha et al. [7] documented ChatGPT's opportunities and limitations in kinesiology education.

2.2 Generative AI in Higher Education and Sport Science

Beyond sports management, the role of GenAI in higher education and sport science is rapidly evolving. Krause et al. [12] identified AI literacy, bias awareness, and prompt engineering as essential competencies, while Wang [26] demonstrated that scaffolding GenAI with real-world projects enhances creativity and relevance. Gately [4] synthesized the potential of GenAI in educational research, emphasizing adaptive learning and automated feedback. Qu et al. [21] provide a meta-analysis of GenAI's cognitive impact in higher education, offering cross-domain evidence of AI's effect on learning outcomes.

In sport science and medicine, Connor and O'Neill [2] reviewed LLM opportunities and risks, while Xia et al. [29] introduced *SportQA*, a benchmark for LLM performance in sports question answering. Naughton et al. [19] identified challenges and opportunities for AI implementation in sports science and medicine teams. Murungi et al. [17] and Qu et al. [20] highlight trends in machine learning and EEG as well as AI-assisted research processes, offering methodological parallels for structured reviews in emerging fields. Saunders et al. [22] further demonstrate how GenAI can support the literature review process, a technique relevant to systematic reviews in sports management.

Skinner et al. [23] provided foundational methodologies for sport management research, relevant for designing and evaluating AI integration in curricula. Wang and Wang [27] reviewed AI in physical education teacher training, offering lessons for sports management pedagogy.

2.3 Synthesis and Gaps

The reviewed literature suggests that GenAI can bridge the gap between theoretical learning and practical, industry-ready skills in sports management education. Research demonstrates promise in areas such as AI-powered storytelling, live event content generation, database automation, coaching systems, digital literacy training, foresight planning, and AI-enhanced marketing analytics. Parallel evidence from other disciplines shows similar integration patterns, reinforcing the transferability of AI-enhanced pedagogical strategies.

Nonetheless, gaps remain. Few empirical studies focus specifically on sports management students' use of GenAI, and mixed-methods research linking quantitative outcomes to qualitative experiences is rare. Comprehensive frameworks for integrating GenAI into curricula—balancing technical training with ethical and strategic competencies—are still underdeveloped. This review addresses these gaps by synthesizing recent, domain-specific studies alongside cross-disciplinary

precedents to form a foundation for evaluating both educational and industry-preparatory impacts of GenAI tools.

3   Methods

This study employed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology [16] to systematically review recent literature on the use of Generative Artificial Intelligence (GenAI) in sports management education for business students. The focus was on peer-reviewed works and reputable preprints examining how platforms such as ChatGPT, Bing Copilot, and Google Gemini enhance learning outcomes, provide personalized feedback, support real-time data analysis, and assist in decision-making within sports-focused educational contexts.

3.1   Study Selection

The review included studies published between January 2019 and March 2025, targeting AI applications in sports management education, sports analytics education, and AI-driven learning environments with direct relevance to business students specializing in sports. To ensure comprehensive coverage, the literature search was conducted across multiple databases:

- *Google Scholar, ResearchGate, arXiv.org*
- *IEEE Xplore, ACM Digital Library, Web of Science, Scopus,* and *Springer-Link*

We used an expanded set of search strings to address gaps identified by reviewers, including:

("Generative AI" OR "Large Language Model" OR ChatGPT OR "Bing Copilot" OR "Google Gemini") AND ("sports management education" OR "sports analytics education" OR "sports business education" OR "sports business learning" OR "sports data analysis")

The initial search retrieved 512 records. After removing duplicates, 374 unique records were screened by title and abstract. Of these, 142 papers were selected for full-text review, and 92 met the inclusion criteria. Figure 2 illustrates the PRISMA-based selection process.

3.2   Inclusion and Exclusion Criteria

Studies were included if they:

- Presented peer-reviewed or reputable preprint research available in full text.
- Focused directly on the application of Generative AI or large language models in sports management education or closely related sports business training contexts.
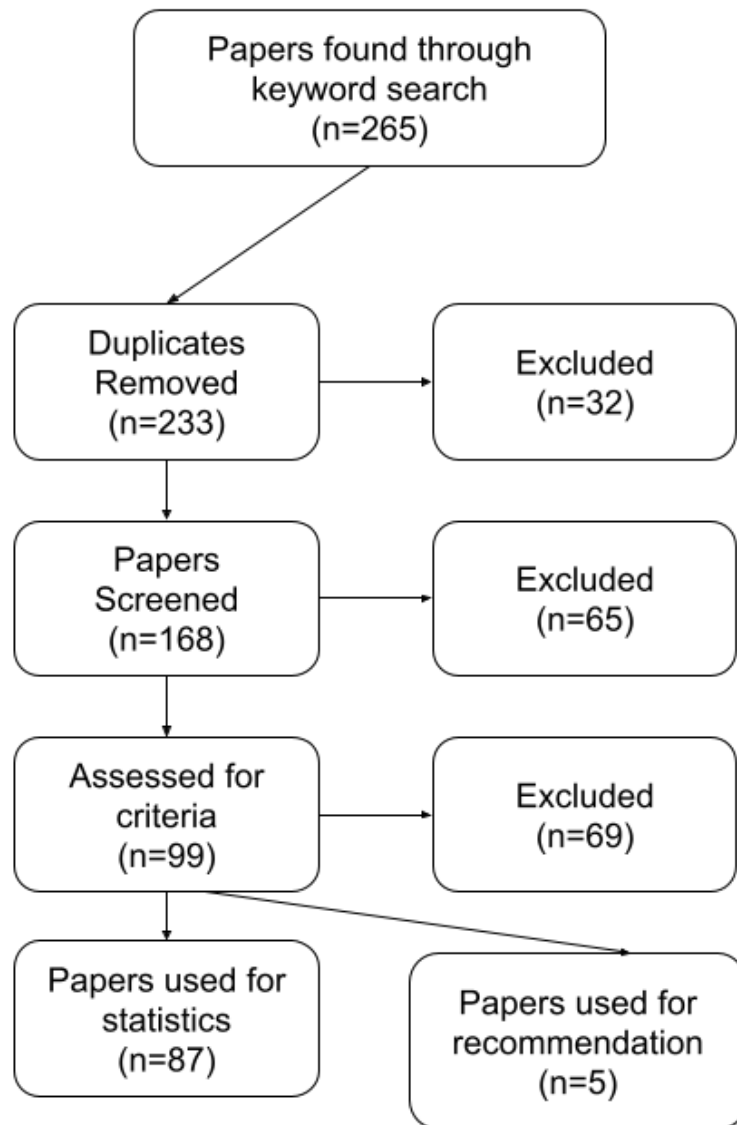- Were published in English between January 2019 and March 2025.

Fig. 2. PRISMA selection process for the reviewed papers

Studies were excluded if they:

− Were inaccessible in full text.
− Mentioned AI only tangentially without substantive educational or sports-
  related relevance.
− Were non-English publications.

3.3 Data Collection and Evaluation

For each included study, the following information was extracted:

- **Bibliographic metadata:** authors, year, venue.
- **AI tool focus:** platform(s) studied (e.g., ChatGPT, Bing Copilot).
- **Educational context:** sports management, sports analytics, or sports business education.
- **Reported outcomes:** learning gains, skill development, industry readiness.
- **Challenges and opportunities:** ethical issues, technical barriers, adoption strategies.

The studies were then thematically coded into categories such as *Curricular Integration*, *Performance Analytics Education*, and *Experiential Learning with GenAI*, allowing synthesis of findings across diverse settings.

3.4 Ongoing Experiments

In parallel with the literature review, we are conducting classroom-based experiments in undergraduate sports management courses. These involve business students specializing in sports using GenAI tools for tasks such as data-driven marketing plan development, sports performance analytics interpretation, and event planning simulations. Observations and qualitative feedback from these experiments will be analyzed and reported in the Results section to complement the systematic review.

4 Results

Our analysis of 92 selected studies, supplemented with recent domain-specific and cross-disciplinary contributions, shows that Generative AI (GenAI) tools such as ChatGPT, Bing Copilot, and Google Gemini are increasingly embedded in sports management education. The literature reveals three recurring themes: curricular integration, industry readiness, and student perceptions and ethics. While the emphasis here is on synthesizing published work, we also include findings from a small-scale classroom pilot to illustrate potential applications.

4.1 Theme 1: Curricular Integration of GenAI Tools

Studies consistently show that embedding GenAI into sports management curricula enhances authenticity and practical relevance. Examples include *Sports-Buddy* [13], which enables students to produce AI-powered storytelling and video analyses for sports media and analytics training, and large-scale text generation systems applied to live event coverage at major tournaments [1]. Merilehto [15] demonstrates how large language models can automate the structuring of sports databases, lowering technical barriers to advanced analytics.

Domain-specific applications broaden the scope of integration. Ma et al. [14] developed a multimodal table tennis coaching system combining tactical and technical feedback, adaptable to broader analytics education. Swim et al. [24] designed a digital literacy course in sport management, illustrating how digital competencies can be systematically embedded. Cross-disciplinary parallels strengthen these findings: Qu et al. [20] integrated HCI datasets into project-based machine learning courses, offering a transferable model for AI-enhanced sports management curricula, while Yunoki et al. [30] reviewed AI in music generation, providing another example of domain-specific AI integration into undergraduate research contexts. Skinner et al. [23] provide methodological guidance that can underpin rigorous evaluation of such curricular innovations.

4.2   Theme 2: Industry Readiness and Skills Development

Evidence suggests that GenAI enhances industry readiness by equipping students with skills in strategic decision-making, marketing analytics, and fan engagement [28, 31]. Baughman et al. [1] illustrate how real-time narrative generation can be applied to sports media, while Haghparast et al. [8] show how AI can be used in foresight planning with financial strategies. Jokela [9] emphasizes AI's transformative role in sports business processes, and Glebova et al. [6] situate it within a wider digital transformation landscape. Nalbant and Aydin [18] specifically link AI to digital sports marketing strategies, while Tan et al. [25] extend this to sustainability and tourism in sports education.

Operational realities also matter. Naughton et al. [19] detail barriers to AI adoption in sports science and medicine teams, highlighting the need for graduates to be skilled in interdisciplinary collaboration and change management. Murungi et al. [17] provide a review of trends in machine learning for EEG analysis, offering a parallel case of emerging technical skills and adoption challenges in another applied field.

4.3   Theme 3: Student Perceptions, Ethics, and Adoption Barriers

Survey data from Krämer et al. [11] show optimism about AI's educational benefits tempered by concerns over ethics, over-reliance, and transparency. Dindorf et al. [3] explore trust and acceptance of AI-driven coaching, while Ha et al. [7] find similar tensions in kinesiology education. Connor and O'Neill [2] emphasize governance and ethical safeguards for LLM adoption in sport science, echoed by Krause et al. [12]. From a process perspective, Saunders et al. [22] demonstrate how GenAI can improve literature review workflows, a capability that can be applied to student projects requiring critical source evaluation.

4.4   Keyword Trend Analysis

An analysis of keywords from reviewed papers reveals three clusters: educational integration terms such as "curriculum," "training," and "experiential learning";

technical references including "ChatGPT," "large language model," and "analytics"; and industry application terms like "sports marketing," "fan engagement," and "performance analysis." Google NGram analysis shows a sharp rise in the co-occurrence of "Generative AI" and "sports analytics" starting in 2022, reflecting growing interest in both research and practice. Qu et al. [21] provide meta-analytic evidence of GenAI's broader cognitive impact in higher education, reinforcing the relevance of this trend.

4.5   Pilot Study: Classroom Experiment

To complement the literature review, a pilot study was conducted in an undergraduate sports management course with five students. Participants used ChatGPT to design a market entry strategy for a hypothetical sports franchise and interpret a sports analytics dataset. Projects completed with AI assistance demonstrated greater clarity and depth in data-driven decision-making compared to previous assignments. While these results are promising, the small sample size limits generalization. Plans are in place to expand the study to approximately 15 students in the next academic term.

4.6   Summary

Across the literature and our preliminary observations, GenAI emerges as a catalyst for authentic, data-rich learning experiences that link theory to industry practice. It supports technical, analytical, and strategic competencies while prompting engagement with ethics and responsible use. Insights from cross-disciplinary AI integration studies in computing [20, 17] and creative domains [30] underscore the transferability of these strategies to sports management education. Despite growth in the literature, there remains a shortage of large-scale, mixed-methods studies that can link educational interventions to sustained industry readiness.

5   Discussion

This study set out to investigate how Generative AI (GenAI) tools can improve learning outcomes for students in sports management education, and the role these tools play in preparing learners for the realities of the sports industry. The synthesis of 92 studies, supplemented by a small pilot classroom experiment, provides a multi-faceted picture of GenAI's current and potential impact.

In relation to the first research question, the literature consistently demonstrates that embedding GenAI tools into sports management curricula can create more authentic, data-rich learning experiences. Examples such as *SportsBuddy* [13] and large-scale sports event coverage systems [1] show how AI can enable students to engage directly with sports media, analytics, and real-time decision-making tasks. Domain-specific tools like the multimodal table tennis coaching system developed by Ma et al. [14] illustrate how AI-based feedback mechanisms

could be adapted for broader analytics education, while database automation [15] helps remove technical barriers to hands-on data analysis. Together, these applications align with competency frameworks in sports management education, which emphasize both technical skills and applied problem-solving.

Addressing the second research question, GenAI appears to be a strong enabler of industry readiness. Studies highlight its value in developing capabilities for strategic planning, marketing analytics, and fan engagement [28, 31]. Haghparast et al. [8] add a foresight perspective by combining AI language models with financial management strategies, while Jokela [9] underscores the transformative impact of AI on business and management processes in the sports industry. Glebova et al. [6] situate AI within a broader digital transformation context, and Naughton et al. [19] identify the operational and cultural challenges that graduates may face when entering AI-augmented professional environments. These insights reinforce the importance of preparing students not only for technical tasks, but also for navigating change management, interdisciplinary collaboration, and technology adoption processes in their future careers.

The role of student perceptions and ethical considerations is equally important. Surveys [11, 7] show enthusiasm for GenAI's educational potential but caution about ethical risks, over-reliance, and the need for transparency. Dindorf et al. [3] highlight psychological and perceptual factors that influence trust and acceptance of AI-driven coaching, while Connor and O'Neill [2] and Krause et al. [12] emphasize the need to embed AI literacy, bias mitigation, and responsible use into curricula. Naughton et al. [19] add that without adequate governance frameworks, AI adoption can encounter resistance within sports organizations, underscoring the importance of preparing students to address such barriers.

The findings from our pilot study, although limited in scale, provide practical evidence relevant to both research questions. For RQ1, students using ChatGPT to complete a market entry case study and perform sports data analysis demonstrated greater clarity and depth in applying theoretical knowledge, suggesting that GenAI can directly enhance learning outcomes in applied coursework. For RQ2, the same students showed improved capacity to analyze and communicate actionable insights—skills closely tied to industry readiness—indicating that even short-term exposure to GenAI-supported tasks can foster competencies valued in the sports business sector.

The implications for curriculum design are clear. GenAI should not be positioned as an occasional enhancement, but rather integrated as a core element of teaching and assessment in sports management education. Embedding AI tools into projects, simulations, and case studies can help students apply theoretical knowledge to realistic, complex scenarios. Partnerships with sports organizations—providing authentic datasets, live projects, and mentorship—can further strengthen this connection. At the same time, explicit instruction in AI ethics, transparency, and bias awareness must accompany technical training, ensuring that graduates are not only competent users of AI but also responsible stewards of its application.

Despite these promising developments, significant gaps remain. Much of the existing research is descriptive, with few large-scale, longitudinal studies that measure the sustained impact of GenAI on learning outcomes and career readiness. The small pilot conducted for this study suggests potential benefits in improving the clarity and depth of student work, but its limited scale prevents broad generalization. More robust, mixed-methods research is needed to establish causality, track long-term effects, and explore how GenAI integration interacts with other pedagogical and institutional factors.

This review is also limited by its focus on English-language publications and reliance on academic databases, potentially excluding relevant industry reports and non-English research. While the search strategy was broadened to include multiple disciplinary databases and recent domain-specific work, there remains scope for incorporating grey literature and practice-based case studies.

Taken together, the findings support a strategic, critical, and ethically grounded integration of GenAI into sports management education. When implemented thoughtfully, these tools can enhance curriculum relevance, strengthen alignment with industry demands, and foster both technical expertise and ethical awareness in graduates. However, realizing this potential will require sustained research, deliberate curriculum design, and ongoing dialogue between academia and the sports industry.

6 Conclusion

This study examined the role of Generative AI tools in sports management education for business students, combining a systematic literature review with a small-scale classroom pilot. The synthesis of recent research indicates that tools such as ChatGPT, Bing Copilot, and Google Gemini are increasingly used to bridge the gap between academic theory and professional practice. In both the literature and our pilot study, GenAI platforms supported authentic, data-driven learning activities and helped students develop skills in analytics, strategic decision-making, and communication.

The review also highlights critical factors for successful adoption. Effective integration of GenAI requires deliberate curriculum design that embeds these tools into core teaching activities, fosters collaboration with industry partners, and addresses ethical considerations such as bias, transparency, and responsible use. While the potential benefits are clear, the current evidence base remains limited, with a shortage of large-scale, empirical studies and few comprehensive frameworks for structured integration.

Our findings suggest several priorities for future research and practice. Longitudinal, mixed-methods studies are needed to assess the sustained impact of GenAI on student learning outcomes and career readiness. Closer partnerships between universities and the sports industry could provide students with richer, more authentic datasets and problem scenarios. Finally, curriculum development should balance technical proficiency in AI tools with the cultivation of critical

thinking and ethical awareness, ensuring that graduates are prepared to navigate an AI-augmented sports business environment.

By addressing these areas, educators and researchers can help ensure that the integration of Generative AI in sports management education is not merely a technological enhancement, but a catalyst for producing graduates who are innovative, adaptable, and equipped for the evolving demands of the sports industry.

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